REMARKS

I. Status of Claims

Claims 12-17 were rejected under 35 U.S.C. §112, second paragraph.

Claims 1-7, 9-18, 70, and 71 were rejected under 35 U.S.C. §103(a) over Riley (WO 01/08169) in view of Weinstein (U.S. 6,869,915) and Jin (Superconducting properties of . . .).

Claims 12 and 15 were rejected under 35 U.S.C. §103(a) over Riley in view of Weinstein and Jin and Wiesmann et al. (US 2003/0050195).

Claim 18 was rejected under 35 U.S.C. §103(a) over Riley in view of any one of Weinstein and Jin and Feenstra (U.S. 5,972,847).

Claims 12-17 are currently amended to clarify that "the film" refers to "the intermediate film." No new matter is added.

Reconsideration of the rejections is respectfully requested in light of the following remarks.

II. Rejections over Cited References

Claim 1 is directed to a method for producing a thin film that contain flux pinning centers. In particular, claim 1 recites "a dopant metal that partially replaces one or more of the rare earth o the rare-earth/alkaline-earth-metal/transition metal oxide." Applicants submit the cited references fail to suggest the pending claims.

Riley

Riley is directed to fabricating coated conductors. However, as the Office Action notes, Riley fails to teach any dopant metals (see page 4 of Office Action). To remedy the deficiency of Riley, the Office Action relies on Jin and Weinstein.

Jin

The Office Action notes that Jin teaches a method of making superconductors wherein 20% of yttrium is substituted with a second rare earth element (e.g., Ho) for the purpose of raising J_c (Id.). The Office Action further asserts that Jin suggests the desirability of producing pinning sites using a a precipitation method rather than using the "method of grinding" described in Jin (see page 2 of Office Action), because the precipitation reaction is less likely to interfere with sintering, texturing and wire fabrication (see page 4 of Office Action). Based on this rationale, the Office Action concludes that "Jin suggests using a precipitation method *for* ***substitution*** *of rare earth elements in a superconductor* (page 78)". (Page 2 of Office Action; emphasis added). Applicants respectfully disagree.

First, Applicants submit that the precipitation method is in no way related to the claimed method of producing a thin film where a dopant metal that partially replaces one or more of the rare earth of the rare-earth/alkaline-earth-metal/transition metal oxide in the precursor solution as recited in claim 1. Rather, as the name suggests, Applicants submit precipitation reactions would be carried out to obtain precipitates (i.e., *secondary phase additives*).

To illustrate, page 78 of Jin teaches that flux pinning enhancement in high-T_c superconductors can be achieved by two *entirely different* approaches: (i) a processing route and (ii) a chemical substitution route.

The first approach is by a processing route, where "[p]revious processing techniques such as neutron/proton irradiation, *precipitation reaction*, and shock-wave loading have proved effective in creating defects for pinning enhancements." (Page 78, right column, first paragraph). In other words, precipitation reaction is one example of a processing route (i.e., an *entirely different* approach than the chemical *substitution* route) that forms flux pinning centers and Jin does not teach or suggest that this method can substitute dopant metals into the rare earth lattice sites. Rather, as noted above, precipitation reactions lead to precipitates (i.e., *secondary phase additives*). As discussed in the last response, such secondary phase additives are inapposite to the claimed

invention of forming dopant metals, which partially *replaces one or more of the rare earth* of the rare-earth/alkaline-earth-metal/transition metal oxide .

The second approach described by Jin is a *chemical substitution route* where the superconductor lattice can be locally disturbed at the unit-cell or subunit-cell level to create coherence length scale defects (see page 78 of Jin). However, Jin specifically *teaches away* from the dopant metal partially *replacing one or more of the rare earth* of the rare-earth/alkaline-earth-metal/transition metal oxide, because Jin teaches that the substitution into the Y-lattice sites shows insignificant improvements in the flux pinning behavior.

Jin specifically notes that "observed improvement . . . in the present work may be viewed as relatively insignificant." (Page 78, left column, seven to four lines from the bottom). Jin goes so far as to explicitly indicate that although "[t]he substitution may be performed on the Y-, Ba-, Cu-, or O-sites[, t]he result of the present work with *insignificant flux pinning enhancement by Y-site substitution* suggests that future efforts should perhaps be concentrated on Ba-, Cu-, or O-site substitution." (Page 78, right column, first paragraph).

In other words, by teaching that flux pinning enhancement by substitution into Y (the rare-earth lattice site) produces insignificant results and that future efforts should be focused on substitution into the other lattice sites, Jin is leading one of ordinary skill in "a direction divergent from the path that was taken by the applicant." (*See Ricoh Co., Ltd. v. Quanta Computer Inc.,* 550 F.3d 1325, 1332 (Fed. Cir. (2008)) (quoting *Optivus Tech., Inc., v. Ion Beam Applications S.A.*, 469 F.3d 978, 989 (Fed. Cir. 2006) and *In re Kahn*, 441 F.3d 977, 990 (Fed. Cir. 2006))). In fact, Applicants submit that Jin is teaching away from the claimed invention by criticizing, discrediting, or otherwise discouraging the invention claimed in the pending claims. (See *In re Fulton*, 391 F.3d 1195, 1201 (Fed. Cir. 2004)).

Jin and Weinstein

The Office Action further asserts that the combination of Jin and Weinstein would render obvious the claimed invention. Applicants respectfully disagree.

As discussed above, Jin fails to suggest that the precipitation reaction can lead to "the dopant metal partially replac[ing] one or more of the rare earth of the rare-earth/alkaline-earth-metal/transition metal oxide". Nevertheless, based on the incorrect interpretation of Jin, the Office Action points to col. 11 of Weinstein as allegedly describing "elements to be substituted for elements in the superconductor . . . for the purpose of dispersing the elements into a matrix formed by the HTS material" using the precipitation reaction (page 4 of Office Action). However, col. 11, lines 9-39 of Weinstein simply refers to another embodiment for forming a thick film YBCO. Col. 11, lines 41-43 only briefly mentions that "uranium doped HTSC film is prepared by other methods described in this patent."

There is no mention in Weinstein a dopant metal can partially replaces one or more of the rare earth of the rare-earth/alkaline-earth-metal/transition metal oxide in the precursor solution. Weinstein, throughout the reference and including in col. 11, describes embodiments to form neutron fissionable elements, which as discussed in the last response, are "very finely dispersed compound[s] with yttrium, barium and oxygen compound of about 300 nanometers in size dispersed within the YBCO matrix." (col. 7, lines 53-55).

Accordingly, Weinstein also fails to suggest the existence or formation of any dopant metals that partially *replace one or more of the rare earth* of the rare-earth/alkaline-earth-metal/transition metal oxide. Withdrawal of the rejections is respectfully requested.

Feenstra and Wiesmann

Feenstra and Wiesmann fail to remedy the deficiency noted above. Feenstra is silent to any form of a dopant metal partially replacing one or more of the rare earth of the rare-earth/alkaline-earth-metal/transition metal oxide. Wiesmann is generally directed to synthesis of $REBa_2Cu_3O_7$,

where RE is rare earth, without heat treating the precursor so that superconductors can be formed on flexible substrates. Neither Feenstra nor Wiesmann teach or suggest that dopant metals that partially replace one or more rare earth of the rare-earth/alkaline-earth-metal/transition metal oxide.

In view of the above amendment, Applicants consider the pending application is now in condition for allowance. Early notification of such is earnestly solicited.

Applicant believes no fee is due with this response. However, if a fee is due, please charge our Deposit Account No. 08-0219, under Order No. 0002802.00174US1 from which the undersigned is authorized to draw.

Respectfully submitted,

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